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SOME ASPECTS OF PAIN*

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The various biochemical and metabolic changes that have at times been regarded as the effects of pain are of very limited value. Inconstant, unreliable, and non-specific, they tell us little as to the nature, intensity, and site of the pain, or even, indeed, as to its very existence. Many of these data have been determined by animal experimentation, and are entirely inapplicable to the study of pain as a process of human mentation. Some of the changes occur whether anaesthesia is employed or not, and cannot therefore be directly linked with the conscious appreciation of pain. The all-important factor of the concomitant feeling-tone is entirely ignored, and we do not know what part is played by the coexisting fear, anger, depression, and exasperation. When the physiologist discusses the "bodily changes in pain, hunger, fear, and rage" we are persuaded to regard them as identical. Pavlov's work with pain analysers illustrates the extreme diversity of the possible results.

The Psychological Concomitants

The psychological concomitants of pain are manifold. An acute pain, when severe, usually dominates the victim's sensorium, often to the exclusion of other internal and external impressions. In other words, there arises a state of preoccupation or inattention to environmental stimuli. This is one of the most common feeling-tones associated with pain. There results an inability to concentrate upon physical or mental activities. Irritability is another very frequent occurrence during states of painful experience.

The major affects of rage, fear, anxiety, or despair may also accompany the feeling of pain. Their presence depends upon the nature of the pain and the circumstances under which the suffering occurs. Thus, the pains of punishment, conflict, illness, and surgical manipulations differ radically in their attendant circumstances, and they will obviously produce very different emotional states. A sudden violent blow will evoke sentiments of anger, or perhaps of fear, as well as a feeling of pain: a victim suffering the agonies of colic or of angina is assailed not only with pain, but with feelings of anxiety, uncertainty as to the outcome and duration, and perhaps despair. The victim in the dentist's chair may undergo his sufferings with alarm, but no anxiety assails him as to the possible deadly significance of his pain or its duration.

It is a commonplace that under the stress of an agonizing experience the sense of time may be disordered. To the sufferer, time passes at a pace much slower than the common estimate: "each minute seemed an hour" is often heard in descriptions of acutely painful experiences. This point is well emphasized in electrical accidents;

owing to the tonic contracture of the flexor muscles, the hand which makes contact with a live wire may grip still tighter and the victim is unable to release himself, although suffering intense agony. This so-called "elongation of the sense of time" is well illustrated in the following personal accounts:

An engineer who became suspended from a live wire conveying a current of 230 volts writes: "I cannot say how long I was suspended: naturally it seemed ages, but my last feelings before losing consciousness were the most agonizing pains I ever wish to feel." Another, who accidentally seized a telephone wire which was grounded, reported: "The duration of the shock could not have been more than a couple of seconds. A man riding by on a bicycle going at a good speed had only time to pass about thirty yards beyond me when the operator got through talking and opened the switch; yet I could see every spoke in the bicycle and it barely seemed to me to be turning. I could feel every reversal of the current, and these reversals occur at the rate of sixty complete cycles per second. It is this intense activity of the brain to electrical impressions that makes an instant of electric shock seem hours to the sufferer."

It is interesting to recall that depression is rare as a concomitant of severe pain. Older writers often mention that physical and moral pain cannot coexist in any intensity. Ribot puts it: "It seems as though the organism had but a limited capacity for either pleasure or pain, and that neither feeling can exist at the same time in its double (physical and moral) form."

With protracted states of severe pain, marked psychological adjustments are to be anticipated. Whether these will fall into any particular pattern is perhaps questionable, and as much will depend upon the previous personality as upon the circumstances of the present suffering. When disability or disfigurement accompanies the distress, the workings of an organ inferiority may at times be traced. To the layman, chronic pain has long been associated with a subtle process of refining or cleansing whereby the individual is exalted.

Sleep may follow intense suffering, and may even amount to pathological drowsiness. This has been noted in tortured criminals, and lesser examples might be quoted in the drowsiness associated with the severe headache of migraine and cerebral tumours. In the sleep which succeeds or accompanies the exhaustion of torture, dreams of a peculiarly vivid or complex character are often experienced. Jack London has described in *The Jacket (The Star Rover)* the particularly coherent and continuous visions of Durrell Standing while undergoing a series of ordeals by strait-jacket.

He would dream that he was addressing learned societies on abstruse problems, often waking to the sound of his voice ringing in his ears and with imaginary pages of manuscript floating before his eyes; that he was journeying on horseback

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through the meadows of some vast farm; day by day the dream story would develop coherently and consecutively, and unroll itself before him. Shrubs and plants would grow from small beginnings into tall vegetation, which would later be felled by the labourers' axes, collected, dried, and burnt in great heaps.

Secondary Sensations

In a few individuals a curious phenomenon may arise during the course of a painful experience. Accompanying the pain feeling—and even at times replacing it—there may be a stimulation of one of the special senses. This is spoken of as a secondary sensation, or "synaesthesia." Secondary sensations associated with a pain stimulus (synalgesiae) are of course merely one of numerous other synaesthetic phenomena which may accompany other experiences. When we read in literature descriptions of painful experiences we not infrequently find the writer using the language of some special sense in order to describe the quality or intensity. Most commonly we find the pain described in terms of colour. This technique may be employed either in the form of a metaphor or of a simile. Thus we find Homer referring to "black pains." Three examples may be quoted in illustration.

In *The Dream Ship* we read: "Bran decided all his likes and dislikes by colour and smell. His favourite colours were yellow, red, green, and wet-black. The last was very similar to ordinary black, which was the colour of toothache. Little rheumatic pains . . . were grey. The worst pain you could get was a purplish-red one."

Again, in Leonhard Frank's *Brother and Sister* we read, apropos of a maternity ward: "There was nothing in the white-painted room but a white-covered ottoman, a white table of instruments, and a white washstand. Lydia was white too, and the doctors and sisters were white. Only the pains had violent colours, all colours."

In describing the pains of a gastric carcinoma J. C. Powys writes in *The Glastonbury Romance*: "The pain took various shapes in Tittie Petherthon's consciousness, according to its intensity. What it resembled now was a round black iron ball of a rusty blood colour, covered with spikes."

When we encounter in literature or poetry such metaphorical intermingling of different sensations we perhaps attribute it to the technique of the writer, who deliberately invokes symbols and startling contrasts, metaphors, and discords in order to emphasize and impress. Undoubtedly this view would be not altogether incorrect, but we are also at times witnessing a less conscious expression of the artist's synaesthetic imagery. Many persons habitually experience secondary along with primary sensations, and examples may find their way into literature, and even into popular diction.

In their minute analysis of *die sekundäre Empfindungen* Bleuler and Lehmann write: "Pains are never felt or recollected without their appropriate colours. They are coloured variously, according to their intensity. Violent pains are accompanied by an idea of white; still more intense and localized pains go from yellow to red and to dark brown; dull headaches give a tint which is almost black; darting pains, an idea of white dots; a pinch, a yellow tint, which is clearer the keener the pain is; indigestion, a more or less clear grey; colic, a clear yellowish tint, which may pass over the red or brown."

At the National Hospital for Nervous Diseases a blind patient who had a keen synaesthetic imagery used to describe all pains as red.

Latent synaesthetic faculties may sometimes be enhanced artificially, as, for example, by intoxication with certain hallucinatory drugs. Mescal is one of the most potent pharmacological measures of this type, and Mayer-Gross and Stein record that on stimulating the cold spots of a patient intoxicated with mescal the sensation was described as "cold, lightning-like, unpleasant, light, and blue." But when the stimulus failed to hit off a cold

spot the sensation was described as "soft, diffuse, dark, and blunt." By the same subject hunger was associated with *green* and pain with *bright red*. Under conditions of partial narcosis, or when pain appreciation is temporarily blunted or abolished, another sense image may replace the sensation of pain.

Thus, a patient under a light nitrous oxide anaesthesia during a paracentesis tympani saw two revolving circles of light, which, at the moment when the instrument was introduced into the ear, immediately came into contact with a noise like two circular saws. They remained in contact while the instrument was in position, and separated when it was withdrawn. This experience recurred each time the operation was repeated.

An epileptic, describing his attack, writes: "Not unconscious . . . but under no circumstances can I talk or move any limb with complete control. If I fall and hurt myself, even severely, I do not actually feel the pain, but rather hear it."

It is well known, of course, that this synalgesic phenomenon may be reversed. Thus stimulation of a sense channel may evoke a feeling of pain as a secondary sensation, even when the stimulus is not intense. Kipling, in *They*, writes of an old lady whom certain colours "*hurt*." Féré described itching of the skin on hearing shrill notes, while Bleuler had a carious tooth which would ache when he heard music. Pain on hearing high notes or on intense light stimuli was described by Helmholtz, and has recently been the subject of exact study by Helmsmoortel.

Susceptibility to Pain

Since pain is mainly a personal sensory experience, its study is beset with the difficulties attendant upon all subjective phenomena. When an individual says he feels pain we are almost entirely dependent upon his descriptions if we wish to learn about its site, nature, and intensity; indeed, when we accept its actual existence we rely upon his word alone. Individuals vary considerably in their powers of description, so that knowledge of another's pain is limited by the victim's intellectual and educational status, as well as by his degree of critical introspection and command of language. Could we investigate twenty persons inflicted with an identical pain stimulus—whether it be the extraction of a particular tooth, a hypodermic injection, or a blow—we would certainly find that the twenty descriptions varied considerably, if not the twenty subjective experiences. Some persons, for example, habitually employ superlatives in speech, and will speak of the pain as "agonizing," "terrible," or "excruciating." The appropriate affect is not necessarily present, however.

But despite all verbal shortcomings and exaggerations there exists an obvious difference in the pain reactions of individuals to what is, as near as possible, an identical stimulus. Common experience teaches that the burly, lymphatic artisan feels pain less than the fragile artist or thinker. As Mrs. Browning put it, "the mark of rank in nature is capacity for pain." Precise data in this matter are scant, however, although Macdonald some years ago made a careful psychometric study of pain sensitivity. His findings confirmed the general impressions by demonstrating a greater sensitiveness in the young than in the old, and in women than in men. Social factors were significant, for the cultured, educated, delicately nurtured, and well-to-do suffered more from pain stimuli than the uneducated, hardier, poorer classes. Racial factors are of considerable importance, for the white and "civilized" peoples are notoriously more sensitive than coloured and primitive races.

A marked degree of indifference to pain has been associated by Lombroso with habitual criminals—particularly those who are addicted to crimes of great violence and

brutality. Schilder has noted this insensitivity to pain in at least two criminals, one of whom was the infamous Baker. This man had been arrested for the murder of a watchman by stuffing cyanide down his throat. Psychological investigation quickly revealed extreme hatred and marked sadistic tendencies, harking back to early childhood experiences. Baker boasted that he had killed at least ten other persons.

It is noticeable that the degree of pain sensitivity does not correspond exactly with susceptibility to surgical shock. Post-operative experiences teach how well women and young children sustain severe surgical ordeals, although actually very susceptible to pain.

Insensitivity to Pain

Very occasionally one encounters persons who seem to possess such a high threshold for nociceptive stimuli that pain rarely, if ever, enters their experience.

For example, I was once asked to see a pale-faced, weedy young man, because his doctor had noticed him to be relatively insensitive to pinpricks and other painful stimuli. This I confirmed. He did not flinch when I drove a pin hard into him; he stated he could feel the prick, but said that "it was nothing very much." Inquiry revealed that this hypalgesia had always existed; minor surgical measures, such as the lancing of a whitlow, had been carried out without discomfort. On several occasions teeth had been extracted without anaesthetic and with no suffering whatever. Once, during an argument, a neighbour broke an umbrella over his head, but failed to provoke any pain. A noticeable feature in this case was the discrepancy between his insignificant physique and his apparent fortitude.

A similar case has been described by Weir Mitchell. A legal friend of his, who died at the age of 56, had never felt pain keenly at any time in his life. Having had his finger crushed during a dispute over politics, he bit it off. He had an ulcer on the toe for three years, yet suffered no pain. A severe abscess once developed on the hand, and, spreading to the forearm, endangered his life. No pain was felt, however, even when the arm was lanced. Operation for bilateral cataract was performed without the use of a local anaesthetic. Only on his deathbed did he complain of a little discomfort.

More recently Dearborn has published an account of Edward H. Gibson, well known in American vaudeville as "the human pincushion." This man had never experienced pain other than an occasional headache. Numerous accidents had befallen him during the fifty-four years of his life: he had been struck in the face with a pickaxe, his head had been laid open with a hatchet, a revolver bullet had passed right through his index finger, his fibula had been fractured, his nose broken, his hand burnt on a hot gas stove until the smell of charred flesh became noticeable. But in all these accidents scarcely any pain had been experienced, although he had sustained a certain degree of shock in some. An attack of acute otitis media troubled him so little that he did not stay away from school. A double pneumonia and a typhoid ran their course without pain. In his music-hall act he would appear twice daily in appropriate undress and invite members of the audience to thrust pins into him anywhere except the abdomen and the groin. Sometimes at one performance as many as sixty pins would be driven in up to their heads. A challenge of 5,000 dollars was offered to any physician who could detect any sign of pain. He once staged a crucifixion act: four gold-plated spikes with needle points were prepared, and a wooden cross was erected. A man then hammered one of the nails through the palm of his hand, and would have continued with the other extremities had not the performance been broken up at this point by the collapse of certain of the audience. There was no evidence in this man's case of obvious nervous or mental disease, and hysteria could be excluded.

Schilder, in discussing this particular case, referred to a similar patient in whom there was a familial incidence of this peculiarity. In Schilder's patient there was no pupillary reaction and no alteration in pulse rate and blood pressure on painful stimuli. Furthermore, there was an extreme degree of sado-masochism.

Varying Pain

Just as persons differ in their susceptibility to pain, so an individual may vary in his sensitivity under special circumstances. Common experience reminds us that under the stress of strong emotion—excitement, anger, pleasure—the threshold for pain becomes temporarily raised. The footballer may be unconscious of the injury which raises a bruise; the soldier may be unaware he is hit until he sees blood flowing from his wound. More prolonged insensitivity may occur in states of exaltation or religious ecstasy, during hysterical states of dissociation, and in mediumistic trances. In other circumstances pain sensitivity may be temporarily lowered. Thus deep introspection, self-analysis, and close attention will augment the effects of stimuli. In certain neuroses and psychoneuroses this process is constantly operating. Some believe that in hypochondria there is a persistent lowering of the threshold, so that quite trivial stimuli are interpreted as pain—possibly even those activities which ordinarily do not reach consciousness, such as the beating of the heart and the movements of the viscera. The threshold for pain may be temporarily reduced by such factors as cold, hunger, and fatigue. Cachectic and debilitated subjects are usually more sensitive to painful impressions. In such mental states as mild depression, particularly when accompanied by agitation, pain susceptibility is increased. With deeper and anergic types of depression, however, the patient may be indifferent to nociceptive stimuli.

The grossest examples of insensitivity are found in certain cases of insanity or mental defect. Idiots and imbeciles often injure themselves by beating their heads against a wall, gnawing their wrists, or pummeling themselves. Cases are quoted of psychotics who plunge their arms into boiling water, or into a fire until the charred flesh drops off, or who chew broken glass.

Goodhart described a post-encephalitic girl who, with her nails, tore out both eyes, with optic nerves attached. Objective tests revealed that ordinarily she appreciated pain stimuli quite normally.

Another case—probably also one of post-encephalitis—has been described by Conn. His patient, a girl of 21, was admitted on account of severe pains in the head and hands. Whilst in hospital she violently fractured all her phalanges, dislocated her thumbs, and tore off her ear. She affirmed that this caused her no discomfort, and, in fact, relieved her pains. She seemed proud of her action and cheerfully displayed her bleeding and mutilated hands to her horrified mother. When asked what was in her mind at the time she injured herself she replied: "I had to see blood, I wanted to see blood come out, I wanted to keep the blood from reaching my head so I wouldn't go out of my mind, as I hadn't menstruated."

The explanation of these insane acts of automutilation is problematical, and may indeed vary with different cases. In some patients the pain experience may be perhaps incorrectly interpreted. Thus, a patient described by Galton once burnt himself accidentally; thereafter he repeated the performance deliberately on several occasions. Perhaps in the majority of cases the self-infliction of pain represents an effort to appease a sense of guilt or to atone for a misdeed, real or imaginary. Thus in Conn's case, quoted above, there was probably a strong feeling of self-reproach on account of masturbatory practices, and the author instances the Biblical injunction, "If thy right hand offend thee, cut it off . . . and if thine eye offend thee, pluck it out."

In a recent novel, J. C. Powys narrates how an obsessional psychoneurotic volunteered to be crucified in the Glastonbury Passion Play in the attempt to atone for an unpardonable offence ". . . right up to the end, till by straining his torso to the breaking-point he lost consciousness, he not only endured this anguish, but he exulted in enduring it. His exultation kept mounting and mounting—extreme pain and ecstatic triumph embracing each other in dark, mystic copulation."

Lastly, it is possible that pain may be deliberately sought in order to relieve a more distressing discomfort or sensation. Thus, the dull aching pain of a neuritis or an intolerable feeling of itching, tickling, or burning, may perhaps be assuaged only by the distraction of sudden fresh sensory impulse, even though painful in character. This phenomenon is, of course, common in normal subjects, and may well be of more frequent appearance among the insane.

The Factor of Attention

An interesting psychological point is raised by the question of expectation. Is a sudden and unexpected painful impression more intolerable than a stimulus of equal intensity falling upon an expectant subject?

Here there is probably an individual factor. In some persons no doubt a pain which comes suddenly and unexpectedly produces a reaction in which shock and discomfort are so intermingled as to outweigh the sensation which would succeed an anticipated stimulus. We know that in the case of electric shocks the factor of surprise is extremely important, the ill-effects being less when the shock is anticipated. There is a much-quoted case of a man who used to suffer deliberately a current of 500 volts. One day he accidentally made contact with this same current and was killed.

On the other hand, there are individuals whose dread of pain sensations is so great that the apprehension of an approaching stimulus greatly outweighs the effect of the pain when it arrives.

Hugh Walpole has expressed this admirably: "Only once or twice in his life had pain actually come to him. He did not mind it so deeply were it part of an illness or natural causes, but the deliberate anticipation of it—the doctor's 'Now look out; I am going to hurt!' the dentist's 'I may give you a twinge for a moment!'—these things froze him with terror. During the war, when he had offered his service, this was the thing that from the clammy darkness and the night leapt out upon him. . . . There had been times at the dentist's and one operation. That operation had been a slight one, but it had involved several weeks of the withdrawing of tubes and the probing with bright, shining instruments. Every morning for several hours before this withdrawing and probing he lay panting in bed, the beads of sweat gathering on his forehead, his hands clutching and unclutching, saying to himself that he did not care, that he was above it, beyond it . . . but closer and closer and closer the animal came, and soon he was at his bedside, and soon bending over him, and soon his claws were upon his flesh and the pain would swoop down, like a cry of a discoverer, and the voice would be sharper and sharper, the determination not to listen, not to hear, not to feel weaker and weaker, until at length out it would come, the defeat, the submission, the scream of pity." Later, again: "The sense of the coming pain had been more awful than anything that he could have imagined. . . . One night earache attacked him. It was a new pain for him, and he thought that he had never known anything so terrible. Worse than all were the intermissions between the attacks and the warnings that a new attack was soon to begin. That approach was what he feared, that terrible and fearful approach. He had said very little, had only laid there white and trembling, but the memory of all those awful hours stayed with him always."

Yet another problem concerns the effect of one pain upon another. Is the net result of two simultaneous painful sensations the algebraic sum of two components? Or does one disagreeable sensation aggravate the other? Thus, does toothache feel worse to a normal person than to one already suffering some other painful malady—for example, sciatica?

Hippocrates stated: "Of simultaneous pain in two places, the lesser is obliterated by the greater." This dictum is illustrated, of course, by the fortitude which victims of severe and prolonged pain may show under

surgical attention. A patient with trigeminal neuralgia endures the pain of an alcoholic injection better than a healthy individual. This axiom of Hippocrates is only partly true, however, because much depends upon the quality of the pains concerned. A nagging or dull pain may so occupy the sufferer's attention as to render him irritable, apprehensive, and hypersensitive to fresh painful stimuli.

We know little as to the limits of human suffering, but we are perhaps justified in believing that when an intense painful stimulus is maintained for extreme periods of time, or steadily increased in intensity, there does not result a corresponding increase in pain feeling. In other words, a point is reached which transcends pain, and beyond which suffering becomes more tolerable. Little or no precise information is available as to the existence of such an adjustment, and the problem is one which to-day belongs more to the sphere of philosophy.

H. G. Wells ranks among the very few who have devoted thought to this problem. In *The Research Magnificent* we read of the elaborate mental exercises by which Beham strove by the deliberate overcoming of fear and pain to attain the "aristocratic life" or the "life set free." "He was clearly suggesting that in pain itself, pain endured beyond a certain pitch, there might come pleasure again, an intensity of sensation that might have the colour of delight. . . . He argued, we exaggerate the range of pain as if it were limitless. We think if we are unthinking that it passes into agony and so beyond endurance to destruction. It probably does nothing of the kind. And following on this came memoranda on the recorded behaviour of martyrs, or the self-torture of Hindoo ascetics, of the defiance of Red Indian prisoners. These things are much more horrible when we consider them from the point of view of the easy-chair . . . are they really horrible at all? Is it possible that these charred and slashed and splintered persons, these Indians hanging from hooks, have had glimpses through great windows that were worth the price they paid for them?"

Asymboly for Pain

Brief reference may be made to a variety of agnosia described by Schilder and Stengel. As the result of a local cerebral lesion, situated probably near the left supramarginal gyrus, a localized or a universal indifference to painful impressions may develop. The disability cannot be described as a "loss" of sensation because certain milder stimuli are still perceived, and also because its distribution does not correspond with that found in cases of focal damage to the sensory pathways. The defect is a higher one in the sense that it entails factors of inattention and of imperception.

Relief from Pain

We have no words in English to signify that state of mind which follows the cessation of a severe or protracted painful experience. "Pleasure" is obviously not the word required, as it suggests a more positive state than that associated with mere stoppage of pain. It would therefore seem that relief from pain is a rather negative and affectless state of mind for which no adequate term is forthcoming. Exception may well be taken to this view, however, and one may perhaps submit that the emotional state following pain is one of *relief*, being essentially attended by definite—even if transient—physical and psychological gratification. The condition of *bienaise* immediately succeeding the emptying of an over-distended bladder or the slaking of a severe thirst instantly comes to mind. One recalls the reply of the lunatic who was asked why he was beating his head against the floor: "Because it feels so mighty fine when I leave off."

Some of the psychological concomitants of painful experiences may linger even after the pain has ceased. Literature contains various examples of this post-algic state.

Paley said: "Pain itself is not without alleviations. It may be violent and frequent, but is seldom both violent and long-continued, and its pauses and intermissions become positive pleasures. It has the power of shedding a satisfaction over intervals of ease, which I believe few enjoyments exceed."

Hugh Walpole writes in his novel *Hans Frost*: "I am suffering to-night from a toothache, and I have always noticed that a toothache is the most unintellectual pain in one's body, just as, in all probability, a stomach-ache is the most intellectual. Have you ever noticed, sir, how bright and clear one's brain becomes between the spasms of indigestion?"

Algophilia

The pursuit of pain as a pleasurable sensation may be encountered under various circumstances; to this phenomenon as a whole the term "algophilia" is applied. There are instances of this which are so commonplace as to be regarded as physiological.

A few examples may be quoted. Discomfort or pain may at times be courted merely in order to enhance the effect of a succeeding pleasurable sensation. One may compare this process with that technique in music whereby a discord is deliberately placed before a harmony for the purpose of contrast. Another common experience is that of probing or fingering a carious tooth or a wound. By such stimulation a dull ache may be converted into a sharper pain; it is noteworthy, however, that this type of stimulus is never applied to a severe or prolonged painful sensation. We have already mentioned that pain may be deliberately sought as a method of alleviating an intolerable dysaesthesia or even of distracting the attention from harassing psychological experiences. Lastly, it must be admitted that some degree of submission to pain is demonstrable in the female in relation to the opposite sex, just as a certain aggressiveness is a normal feature in the male. When, however, the degree of pain which is sought is excessive or prolonged, or is pursued as an end in itself, then the phenomenon transcends normality.

Four main types of morbid algophilia may be enumerated.

1. *Psychotic*.—Instances of the enjoyment of pain among the insane have already been discussed. It is necessary to satisfy oneself that there is no impairment of sensation in such cases.

2. *Racial*.—Among certain communities or races pain may be deliberately endured as a traditional practice. The Samurai of Japan, the Spartans, the Stoics, and the Paramahansas or nomadic Fakirs are cases in point. It is probable that in this group the pain itself is not desired so much as the accompanying virtues of fortitude, courage, and hardihood, which are deemed the spiritual counterparts. In this way Scaevola thrust his arm into the fire to demonstrate Roman endurance. At the flagellation dances of the Fulami young men bared to the waist call for volunteers to beat them with scourges, at the same time smiling, sneering, and taunting the flagellator. The young women bystanders are worked up into a frenzy of admiration, and tearing off their bead ornaments throw them at the feet of the victim.

3. *Religious*.—Self-abasement and the auto-infliction of pain find a cult among enthusiastic devotees of all manner of religious beliefs. We can trace here the associated idea of purification through ordeal of pain and fasting. Here again pain is desired, not for itself alone, but as a means to an end.

Last century Cornelius and Overbeck—two gloomy and eccentric pre-Raphaelite artists—used to prepare themselves for painting by flogging and fasts. In the same vein they eschewed the services of professional models, lest their canvas Madonnas should betray some undesirable traits of fleshliness.

If one may refer again to Hugh Walpole, we read how his Man with Red Hair, by suffering pain himself, had come to associate in his diseased brain the infliction of suffering with idea of power: "A good God, a sweet God, a kind

beneficent God. That is no God. God is first cruel, terrible, lashing, punishing. Then when He has punished enough, and the victim is in His power, bleeding at His feet, owning Him as Lord and Master, then He bends down and lifts the wounded brow and kisses the torn mouth, and in His heart there is a great and mighty triumph. . . . Even so will I do, so will I be . . . greater than God Himself."

4. *Masochism*.—The association of sexual stimulation or gratification with physical suffering or mental humiliation is a well-known phenomenon. It exists in some degree in normal individuals—characteristically the female when in association with the male. The attachment of a woman to a brutal and worthless husband, the fidelity of the prostitute towards the souteneur, are commonplaces which have been worn threadbare in literature. When accentuated, however, a definitely morbid phenomenon emerges. Although in some respects masochism is the complement of sadism—where pleasure is obtained from the infliction of suffering—yet the two states are often interwoven. Under obvious masochistic trends there often runs an overt or suppressed sadism. Even in the life and works of the Marquis de Sade masochistic traits are demonstrable. To express the idea of an ambivalent "sado-masochism" the term "alogagnia" is often applied. We owe the word "masochism" to the writings of a nineteenth century Austrian named Sacher-Masoch, whose imaginative flights largely concerned ideas of self-abasement and mutilation. In retrospect we can detect similar trends in earlier writers, as, for example, Aristotle, Thomas Shadwell, and Jean-Jacques Rousseau.

The well-known passage from the *Confessions* of the last may perhaps be quoted: "Mlle Lamercier . . . at times threatened to inflict upon us that childish punishment which we deserved. For some time she contented herself with threats, and that threat of a chastisement quite new to me seemed terrifying; but after its execution I found it less terrible in fact than in expectation, and the funniest thing was that this punishment endeared me still more to her who had carried it out. All the truth of my affection and all my natural docility was required to keep me from seeking more of the same treatment by deserving it, for I had found in the pain, even in the shame, a mixture of sensuality which had left behind more desire than fear of experiencing it again at the same hands. . . . The same punishment administered by her brother had no pleasurable effect. . . . The second occasion was also the last, for Mlle Lamercier, having no doubt noticed by some sign or other that this chastisement was not fulfilling its object, gave it up. . . . Hitherto, we had shared the same room, and, in the winter, even the same bed. Two days later I was made to sleep in another room."

A vein of masochism runs through much of the decadent literature of the nineteenth century. We find flagrant instances in many of Swinburne's works (*Lesbia Brandon*, *Our Lady of Pain*, *Tebaldeo Tebadei*; in Barrès' *Ennemies des lois*; and in D'Annunzio's *Forse che si forse che no*).

Pain and the Sexual Feelings

The mode of interaction of such apparently dissimilar phenomena as pain and sexual stimulation is of interest. Various ideas have been held upon this subject in the past. Some would ascribe masochism simply to the mechanical and reflex stimulation of the nervi erigentes by strong afferent impulses along the spinal segments. Others would invoke the general "tonic effect" of pain upon the organism (Féré). According to another viewpoint pain shares with the sexual orgasm the power of arousing strong emotion—whether of rage or fear—in greatest degree. Thus, André Gide describes how his extreme hypersensitivity, which used to distress him when ill with phthisis, would afterwards afford him exquisite enjoyment. Any very keen sensation, he concluded, might become a source either of delight or discomfort, according to the state of the general health.

Perhaps the most acceptable hypothesis is that of a conscious or unconscious association of ideas linking up certain pain stimuli with concepts or recollections of a sexual nature. These latter may be so intense as virtually to swamp the pain sensation and produce a temporary analgesia.

Havelock Ellis has discussed at length and with great clearness the probable mechanisms underlying the masochistic phenomena. He points out that in algolagnia the pain in question is less important than the violent emotional outburst; that the pain endured is never intense, and is usually, if not always, bound up with sexual activity; divorced therefrom, pain is no longer pleasurable. The sufferings experienced by a woman in association with sexual excitement may be gratifying in that they enhance the dominant and assertive characters which she appreciates in her male.

Krafft-Ebing summarizes the problem thus: "The person in a state of masochistic ecstasy feels no pain. When a woman says that she finds pleasure in the pain inflicted by a lover, she means that under the special circumstances she finds pleasure in treatment which would at other times be felt as pain. Or else that the slight pain experienced is so quickly followed by overwhelming pleasure that in memory the pain itself seems to have been pleasure, and may even be regarded as the symbol of pleasure."

PHYSICAL EFFICIENCY AFTER OPERATIONS FOR HERNIA *

BY

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The simple title of this discussion is, I think, no index of the extent of the subject. It certainly involves the primary consideration of the problems of detailed technique for the effective radical cure of various types of hernia; but in addition wider considerations, such as the bearing of age and the physical type operated on, repair processes in muscle, and aponeurosis, and recovery of body function, and the importance of the psychical element in this relationship must be included.

The practical surgeon will in the first place wish to determine what type of operation is most likely to be effective in producing a lasting cure in the individual case. Indeed, the successful closure of the hernial opening will generally be admitted as being of the first importance in restoring the physical efficiency of the patient. The types of hernia to be considered are inguinal, femoral, umbilical, and incisional and traumatic. A superficial examination of records shows that the incidence of inguinal hernia is much greater than that of any other type. For example, in five years' operations for hernia at St. Thomas's Hospital the approximate proportions were 11 inguinal hernias to 1.4 femoral and 1 ventral. I shall therefore take as my text inguinal hernia. I propose to analyse the published results of operation for this condition and refer to my own experience of it, leaving it to those who follow to fill in gaps and comment on my argument.

Treatment of Inguinal Hernia

The radical treatment of inguinal hernia will be admitted as having been on a sound basis since the introduction of Bassini's method in 1890. Since that date many modifications of technique have been put forward, and some have found a permanent place in surgical

practice. Bassini's method and the others that followed him were based on the principle of obliterating the sac and reinforcing, rather than reconstructing, the musculature which closes the inguinal canal. The next important advance was the use of the fascial suture or graft, a procedure which enables the surgeon in some degree to neglect the normal muscle closure of the canal and to substitute a fibrous diaphragm: this procedure is particularly adapted to the treatment of direct hernias, but its use for indirect hernias has advocates.

It might be thought that, in view of the amount of consideration given to the subject and the great bulk of cases which have been operated on, a common standpoint as to the best methods and their effectiveness would have been reached by now. This is, however, by no means the case. Inadequate or inaccurate information as to the late results of various operations is mainly responsible for this state of affairs. It is only in the last five or ten years that any systematic attempts to follow up hernia operations have been made. Even then in the figures resulting from such investigations one finds difficulty in assessing their proper value. The methods and standards of classification vary widely, and in all groups of figures there is a certain percentage of untraced cases which clearly weakens the value of any results arrived at. A further difficulty is that of estimating the value of new methods on account of the relatively small numbers reviewed and the shortness of the period of observation.

Assessment of Results

In discussions between surgeons on the end-results of hernia operations, the general impression to be gathered is that the individual surgeon using the method he favours seldom sees recurrences. No doubt there is a tendency for failures to be seen by surgeons other than those who first operated, but I cannot help thinking that a close and critical follow-up of all cases would show a much higher recurrence incidence than we believe to exist.

My own confidence in the satisfactory nature of results of inguinal hernia operations was shaken by my experience as consulting surgeon to the metropolitan police. Here we are dealing with a body of men some 20,000 strong, of picked physical efficiency, and young to middle-aged. The force, on the whole, is not exposed to excessive physical exertion. One would therefore expect a high standard of permanent cures after radical operations. The figures I have collected in relation to this group are small, but appear to be fairly constant each year. In the five-year period 1929-34 241 police officers were operated on for inguinal hernia. In 212 cases the operation was primary, the condition being double in fifteen. Four operations were for strangulated hernia. Twenty-five operations were for recurrences, which suggests an approximate recurrence rate of at least 11.5 per cent. In order to investigate the matter more fully I asked my first assistant, Mr. N. R. Barrett, to follow up and examine personally all cases of this type operated on at St. Thomas's Hospital for the previous five-year period. This investigation showed the incidence of recurrence to be even higher than this figure, and I will refer in detail to his findings later.

In the literature the most important statistical analysis of this subject is to be found in an article by Block.¹ He published in 1933 the collected results of 20,199 inguinal hernia operations. His figures were obtained from 650 different surgeons working in German clinics. The results he quotes are essentially of a bulk character, as he does not show the incidence of recurrence in relation to sex, age, or anatomical type of hernia. He himself recognizes that the estimate of recurrence varies with the individual observer. What one surgeon would term a weak inguinal region another would classify as a recurrent direct hernia.

* Read in opening a discussion in the Section of Surgery at the Annual Meeting of the British Medical Association, Bournemouth, 1934.